PROCEEDINGS

OF THE

ROYAL SOCIETY OF EDINBURGH.

VOL. VI. 1867–68. No. 74.

EIGHTY-FIFTH SESSION.

Monday, 25th November 1867.

PROFESSOR **PLAYFAIR**, C.B., Vice-President, in the Chair.

The following Council were elected:—

President.

PRINCIPAL SIR **DAVID BREWSTER**, K.H., LL.D., D.C.L.

Honorary Vice-President, having filled the Office of President.

HIS GRACE THE **DUKE** OF **ARGYLL**.

Vice-Presidents.

Principal FORBES.
Professor C. INNES.
Prof. LYON PLAYFAIR, C.B.
D. MILNE HOME, Esq.
Dr CHRISTISON.
Professor KELLAND.

General Secretary—Dr JOHN HUTTON BALFOUR.

Secretaries to the Ordinary Meetings.

Dr GEORGE JAMES ALLMAN.
Professor TAIT.

Treasurer—DAVID SMITH, Esq.

Curator of Library and Museum—Dr DOUGLAS MACLAGAN.

Councillors.

Dr A. CRUM BROWN.
Dr BURT.
Dr MATTHEWS DUNCAN.
Professor TURNER.
Dr JOHN MUIR.
Rev. THOMAS BROWN.
JAMES SANDERSON, Esq.
Hon. LORD NEAVES.
R. W. THOMSON, Esq., C.E.
GEORGE ROBERTSON, Esq., C.E.
Professor PIAZZI SMYTH.
PATRICK DUDGEON, Esq. of Cargen.

Monday, 2d December 1867.

Opening Address by Sir David Brewster, the President. Communicated by Professor Kelland.

Gentlemen,—If it is the primary object of our scientific institutions to advance the interests of science, to promote its diffusion, and to extend its influence, it is not the least of its secondary functions to grapple with intellectual error, and to expose those various forms of superstition and spiritual agency which are now exercising such a perilous influence over half-educated minds.

In mediæval times, when positive knowledge had hardly assumed a definite form, and when the little which did exist was confined to particular classes of society, minds of activity and power naturally threw themselves into depths which they could not sound, or among quicksands from which they could not escape, and thus sought, in wild speculation, for the excitement and notoriety which they could not find in patient research. But in an enlightened age, when real knowledge has made such extraordinary advances, and when the open fields of literature and science invite into their broad domains every variety of genius, and offer a rich harvest of truths to the patient reaper, it is difficult to discover how men of character and high attainments should have surrendered themselves to opinions not less visionary than the legends and prodigies of the ancient mythology.

From such a high level the stream of error has a quick and easy descent, permeating the more influential circles, but driven back by the shrewd intelligence of the pious and educated poor. It is doubtless among the middle and upper classes of society that this credulity and love of the marvellous is most conspicuous. It is luxuriant among the gay and the idle, who have been reared on the rank pastures of our fictitious literature, and who have no faith in those material forces and those cosmical laws which are in daily operation around them. But whatever be its cause, its only cure is a system of secular and scientific education.

When the scholar has learnt to read, to write, and to count, he has obtained only the tools of instruction. To acquire a knowledge of the works of God and of man, of the miracles of nature and of art, is the first step in the civilisation of the people. Without such information the highest as well as the humblest of our race is unfit for a place in the social scale. He may have learned to read his Bible, and may have read it. He may have committed to memory every sentence of the decalogue; and he may have packed into the storehouse of his brain all the wisdom of Solomon, and all the divine precepts of One greater than Solomon, while he is ignorant of everything above him, around him, and within him.

To live upon a world so wonderfully made, without desiring to know its form, its structure, and its purpose;—to eat the ambrosia of its gardens, and drink the nectar of its vineyards, without inquiring where, and how, and why they grow;—to toil for its gold and its silver, and to appropriate its coal and its iron, without studying their nature and their origin;—to tremble under its earthquakes, and stand appalled before its volcanoes, in ignorance of their origin and of their power;—to see and to handle the fossils of animal and vegetable life without asking where, and how, and why they perished;—to neglect such pursuits as these would indicate a mind destitute of the intellectual faculty, and unworthy of the life and reason with which it has been endowed. It is only the irreligious man that can blindly gaze on the grandeur and beauty of material nature without seeking to understand its phenomena and laws.—It is only the ignorant man that can depreciate the value of that true knowledge which is within the grasp of his divine reason;—and it is only the presumptuous man that can prefer those speculative inquiries before which the strongest intellect quails, and the weakest triumphs. "In wisdom hast Thou made them all," can be the language only of the wise;—and it is to the wise only that "the heavens can declare the glory of God," and that "the firmament can show forth His handiwork."

Under the influence of views like these I have, during the last thirty years, in various works and on various grounds, pleaded for a national system of secular and scientific education. Like other germs of truth, it excited the ridicule of ignorance, and alarmed the timidity of a political and religious fanaticism; but as the poorest seed, even when cast among thorns, sometimes springs into life, the cause of secular and scientific education has been gradually entrenching itself in the aspirations of the teacher and the taught, and though not yet comprehended by our statesmen, it must sooner or later receive the sanction of Parliament.

The British Association, who have done more for science in a quarter of a century than all the Governments of England have done since the revival of learning, have taken up the subject of scientific education, and have issued an elaborate report which cannot fail to command the approbation of the public. The rejection of the School Bill, when twice submitted to the House of Commons, warns us that a tribunal so constituted is ill fitted to decide the great questions in which art and science, morality and religion, are so deeply concerned; but in the great "Leap into the Dark," mysterious though it be, and deep as may be the abyss into which it has plunged us, we may yet have fallen upon a solid platform, from which orators, of a new class and loftier aspirations, may plead the cause of neglected science, of taxed and persecuted inventors, and of those higher and holier interests which statesmen have failed to advance or comprehend.

In calling your attention to this subject, it may be useful to mention that the Report of the British Association was drawn up principally by Fellows of the Royal Society of London, and that they count upon the assistance of other institutions in carrying out the work which they have begun. That science itself will be advanced by teaching it in our schools, and more fully in our universities, is a proposition too obvious to be questioned. A startling fact, a striking experiment, and even a popular toy, has often given an impulse to genius; and some of the greatest of our discoverers, even Newton and Leibnitz, spent their early life in flying kites, making sun-dials, and constructing simple machines. The smattering of science in the school will acquire solidity in the university, and will re-appear in the workshop with valuable applications. It was the chemical teaching of Dr Black that made James Watt the greatest inventor of his age; and it was the rush of electricity through a mile of wire that gave the electric telegraph to the world.

Extensive as is the scheme of scientific instruction and scientific training proposed by the British Association, we would venture to suggest that some knowledge, however small, of the fine and useful arts should be introduced into our schools and universities. If we cannot teach the arts of the architect, the painter, the sculptor, and the manufacturer, we can at least exhibit and explain the most interesting of their works, and thus cultivate in some degree the public taste. There is hardly a neighbourhood where machinery for almost every art, and where the works of the ancient masters, may not be shown at stated periods to the young; while by the facilities of locomotion our galleries of art and our museums of industry may be visited by the humblest of our schools. But even under the village roof-tree we may cultivate the taste, and add to the happiness of its inmates. We may decorate their walls by permanent photographs of the finest specimens of painting and sculpture, and through the stereoscope they may gaze, as if on solid marble, upon the Apollo Belvidere, the Laocöon, and the Venus de Medicis, or upon the modern productions of Canova, Thorwaldsen, and Chantry. Even in the plain furnishings and simple utensils of the cottage we may refine the tastes and elevate the sentiments of the hardworking children of toil. The beautiful in art and nature, equally the gift of the great Giver, may be enjoyed by the humblest of our race. The cup of cold water will taste the sweeter, and the goblet of wine the richer, when the eye rests with pleasure on their lovely forms. The village Lavinia will be "adorned the most" when she has exchanged the apparel of the ball-room for the simple drapery of a less luxurious age. Nor will the cottage family be less joyous when, in their plot of flower-garden, they revel in the harmonies of colour, or when the mantelpiece or walls of their dwelling exhibit to them the choicest forms of art, or those scenes of the picturesque or the sublime with which modern science can so cheaply supply them.

The pleasures of the eye and the ear are the cheapest and sweetest of our luxuries, and when they shall be equally appreciated by the classes whom no common sympathy had previously blended, or whom the usages of a barbarous age had too widely severed, society will be welded by more enduring bonds, and new buttresses added to the social fabric. The artisan or the labourer who devotes his leisure hour to the observation of nature or the admiration of art, who gathers for his family the curious plant or the travelled pebble, or who presents to them the elegant flower vase or the graceful statue, is not likely to seek for excitement in village revels, in political clubs, or in dishonest combinations. His moral nature will rise with his material tastes; and while his less instructed neighbours will look up to him as a model for imitation, his more educated superiors will appreciate his acquirements as a companion or a friend.

It is only in those studies where the eye becomes our teacher, that we can unite in one common pursuit the dissevered classes of society. It is in our galleries of art,—in the rich museums of our cities,—in our botanical, horticultural, and zoological gardens,—or in our crystal palaces, where art and science are rivals, that the children of wealth and of toil can assemble in the common admiration of all that is beautiful and sublime. It is among the remains of ancient and the achievements of modern art, and amid the beauties which we daily appreciate, and the lovely forms of organic life which are ever before us, that we can rise to a purer morality and a higher civilisation.

But it is to the middle, and even to the upper classes, and through them to the nation, that scientific teaching will offer its richest benefits. The functionaries who administer our affairs are in number legion. Without science, without that elevation of character which positive knowledge confers, we can readily understand how the greatest interests of the state are mismanaged,—how interests equally great are neglected,—and how the public wealth is recklessly squandered. Incompetent subordinates assume the importance, and discharge the duties of their chiefs; and while the deep problems of practical science receive a wrong solution, the feelings and interests of inventors and discoverers are utterly disregarded.

In this great country, wealthy by its commerce, its agriculture, and its manufactures, and in no other country in the world, even the poorest, our numerous scientific boards are conducted by men who are too honest to have any pretensions to science, and whose aggregate wisdom, if it exists at all, is enshrined in the cerebellum of a secretary or a clerk. The parsimony of the Exchequer grudges a salary for the services which science only can supply, and consigns to unpaid and irresponsible hands the great interests in which life and property are at stake.

Nor will scientific education be of less value to the lawgiver and to the statesman—to the men who preside over the life and death of the nation,—who make its laws and direct its battles.* To them the British Association has applied in vain for the national recognition of science. Its parliamentary committee, presided over by Lord Wrottesley (a patriotic nobleman, now removed to a brighter sphere), and containing members of both Houses of Parliament, have pleaded in vain for a board of science, to extend its influence and to introduce it into our schools. They have proclaimed to successive governments "that science has not its due weight and importance in the councils of the nation;"—that "a feeling pervades the community at large that our country's welfare, and even safety, depends on its due encouragement and fostering;"—and adopting the words of our great political economist, Mr Mill,†—"that no limit can be set to the importance, even in a purely productive and material point of view, of mere thought,"—and "that every extension of knowledge of the powers of nature is fruitful of application to the purposes of nature and life."

But there is another class of public servants to whom scientific education must be of great importance. Peaceful as science is in its theoretical as well as its practical aspect, it has often to wage war against pirates; and with its meagre exchequer to struggle against the hoarded pelf of unprincipled capitalists, or the combined resources of needy speculators. The discoverer or the inventor is thus driven into a court of law, and our judges and juries have to decide in the most perplexing suits where profound science can be their only guide. To decide against a pirate who has stolen the intellectual property of his neighbour, and can plead only a mistake in the specification of his patent, is a trivial error, even if the decision is unjust; but it is a deeper injustice, and one not to be forgiven, when an inventor is deprived of a property which he had provided for his family, and when the verdict rests either upon the ignorance of the judge, or upon the erroneous appreciation of scientific testimony.

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* The Earl of Harrowby, as one of the Parliamentary Committee of the British Association, stated "that those who administer the affairs of the country ought, at least, to know enough of science to appreciate its value, and to be acquainted with its wants and bearings on the interests of society."

† Political Economy, vol. i. p. 52.

But there are still higher interests for which a scientific education is essential,—interests intensely national, and affecting the well-being of every member of the community. In expounding the results of the Great Exhibition of 1851, our eminent colleague, Dr Lyon Playfair, as one of the commissioners, did not scruple to tell the Government "that all European nations, except England, have recognised the fact *that industry must in future be supported, not by a competition of local advantages, but by a competition of intellect* . . . that each foreign metropolis rejoices in an industrial university;—that the result of the Exhibition was one that England may well be startled at,—and that British manufacturers themselves were convinced that most of the foreign countries were rapidly approaching, and sometimes excelling, us in those very manufactures which were our own by hereditary and traditional right." This voice of wisdom and of warning was listened to only by that noble Prince, who, but for petty jealousies and rival interests, would have established that great college of industry, with affiliated schools, which he had announced to his friends.

The same mortifying lesson, thus neglected by the Government, was taught us by the French Exhibition of 1855. The British jurors were so surprised at the superiority of France and other nations in many of the scientific and useful arts, that it became the subject of frequent discussion; and at a meeting called for the purpose, the jurors unanimously declared "that it was only by great exertion, under the most favourable circumstances, that the hitherto almost uncontested superiority of Great Britain in the mechanical and chemical arts could be maintained."*

This second voice of warning, like the first, found no echo among our statesmen. Foreign nations were gradually out-running us in the most important of our arts, and the French International Exhibition of 1867 exhibited even to some British statesmen the infatuation of their policy. Dr Playfair and the British jurors again sounded the note of alarm. Lord Granville and Lord Taunton have given public expression to the same judgment, and we may therefore hope that, under a wider constituency and a wiser legislature, the rights of science may be vindicated; and that scientific instruction, beginning in our schools, may be extended to every department of art which contributes to the wellbeing of the citizen, and to the wealth of the empire.

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* This meeting was attended by Sir David Brewster, who was called to the chair, by Sir Charles Manby, Secretary to the Institution of Civil Engineers, who was requested to act as secretary, and by Professor Graham, Master of the Mint, Professor Owen, Professor Wheatstone, Professor Cockerell, Mr Fairbairn, Mr George Rennie, Mr De La Rue, Mr Warren De La Rue, Dr Hoffmann, and Mr Crampton, civil engineer. Several jurors, Sir Charles Barry, and others who were unable to attend, warmly approved of the object of the meeting.

Resolutions of a more specific nature were moved by Professor Owen, Professor Wheatstone, and Professor Cockerell, and it was resolved to represent to the British Government the convictions of the jurors.

If these views are approximately correct,—if our statesmen, our lawgivers, and our official functionaries are unacquainted with science even in its popular aspects, what must be the intellectual condition of the residue of social life in the upper and middle ranks of the community! All of us can testify, if we had courage, that there is not one person in a hundred who believes, or who understands if he believes, that he lives upon a ball of earth moving daily about its axis, and annually around the sun; and that these two motions are so adjusted as to give us that variety of seasons on which our daily happiness so essentially depends. How few know anything more of our nocturnal lamp, than that the moon has horns in one week and is without them in another. How few know anything more of the telescope and microscope, than that they look into one end of a tube, and see something nearer and larger at the other. How few know anything more of the barometer and thermometer, than that the one is placed inside and the other outside of the house, and that the one tells us something about rain, and the other something about cold. How few know anything more of their inner and outer being, than that the one requires to be fed, and the other to be clothed.

To such persons scientific instruction must be the greatest of gifts; and if we cannot wrest it from the State, it becomes our duty to accomplish by private enterprise what in other countries has been done by the nation.* The efforts of individuals must, of

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* The following valuable observations by a competent judge, Dr R. Angus Smith, F.R.S., justify many of our suggestions :—

"Within the last thirty or forty years the violent attempts to teach the course, be feeble in their nature, and limited in their results; but many of the noblest schemes of philanthropy have sprung from one willing heart, and been achieved by one brawny arm. In the field of education there may be many labourers, and there is hardly an educated person who may not throw some seeds into its soil, and glean in return a portion of the harvest which it yields. Each of you must feel some interest in a parochial or other school, in which the youth receive no instruction respecting the material universe around them, and the productions of nature and of art which are daily within their reach. At a very moderate expense you can furnish a telescope and microscope, a barometer and thermometer, a stereoscope, a magic-lantern, a magnet, a burning-glass, and a small electrical machine such as that little globe of revolving glass with which Faraday began his illustrious career; and with this apparatus, during an hour or two in each week, phenomena could be displayed and illustrated, which would be a source of instruction and amusement, relieving the monotony of the school, and giving the teacher a new power over the minds and affections of his pupils. Important as this step would be, it is but a small part of what might be done in conveying scientific instruction.

people here, by schools, mechanics' institutes, and lectures, given or promoted by benevolent persons, have wearied the souls of all those who have co-operated or even looked on with interest. In Germany, without any commotion, calmly and pleasantly, the youths have been trained in schools and colleges without number, and so thoroughly, that they are able to supply foremen and managers to their own manufacturers' establishments, and to send a supply also to foreign countries. In other words, whilst we have failed with our most violent efforts, and with much noise, to teach our own people, they have succeeded not only to teach their own citizens, but to assist in educating the rest of the world. In this matter of education the governments have been able to mould the nation's mind, and to alter the habits of a leading portion of it in a few years. A careful education would probably show its influence in less than *ten* years. . . . . *We require education in the fundamental principles of physical science;* the moral principles, as found in literature, are not alone sufficient either for the higher cultivation of the mind or every pursuit of the useful arts. This applies to the rich and not merely to the poor."—*Proceedings of Manchester Phil. Society*, Nov. 12, 1867.

In reference to the provincial *lectures*, which, Dr Smith says, "have wearied the souls of their promoters," there can be no doubt that, if properly organised by a committee in our University seats, such as the Committee for Local Examinations, a valuable course of scientific and literary instruction might be provided for every class of the community.

In most of our provincial towns there is a museum of natural history and antiquities, which would be a valuable auxiliary in teaching natural science in the neighbouring schools. But even where no such collection exists, a small museum might be established in the humblest of them. Within their own narrow sphere objects of natural history might be obtained, and many a private collection in the district would surrender a tithe of its specimens for the public use. Our Industrial Museum, too, might distribute a portion of its overflowing collections, and even the British Museum might contribute some of its innumerable duplicates, and bring into use its accumulated and unproductive treasures. Itinerant museums, like the itinerant libraries, might be chartered in the same cause, and might sell or exchange the duplicates which are found in different localities.

By these means our school museums might obtain specimens of the more important rocks which form the carpentry of the globe,—of the metallic ores, and the metals themselves, which are in daily use,—of the more precious minerals which are employed for the purposes of art or ornament,—and thus give to the youthful student some knowledge of the world on which he resides, and of the elements of civilisation which it embosoms.

In the departments of Zoology and Botany we cannot expect to collect specimens for our schools, but our travelling menageries, and the museums and botanic gardens of our principal towns, would supply, to a great extent, the means of instruction. But even when these are beyond our reach, photography, and the stereoscope which gives relief to its pictures, might be advantageously employed. The photographic process will give us accurate representations of those objects, both of nature and of art, which it would be desirable to describe and to explain in the instruction of youth. In the department of zoology, the picture might be often taken from the living animal, standing before the camera in vigorous life and transcendent beauty; or when this cannot be done, from the fine specimens of zoological forms which adorn our metropolitan and provincial museums. With equal accuracy might be represented the osteology and integuments of animals,—the framework which protects life, and to which life gives activity and power.

The trees and plants too of distant zones will show themselves in true relief,—the banyan clinging with its hundred roots to the ground,—the bread-fruit tree, with its beneficent burden, or the deadly upas, preparing its poison for the arrow of the savage or the poniard of the assassin. With no less interest will the schoolboy gaze on the structures of the inorganic world,—the minerals which have lain in the earth beneath his feet,—the crystals which chemistry has conjured into being, displaying to him their geometric forms, infinite in variety, and interesting from their rarity and value. Painted by the very light which they reflect, he will see the Koh-i-noor and other diamonds, and the huge rubies and sapphires and emeralds which have adorned the chaplet of beauty, and sparkled in the diadems of kings. The gigantic productions of the earth will appeal to him with equal power—the colossal granites which have travelled in chariots of ice, the precipices of ancient lava, the doric colonnades of basalt, and the fossil giants of the primeval world, which trod the earth during its preparation for man, and have been embalmed in stone—to instruct and to humble him.

In acquiring a knowledge of physical geography, of the grander aspects of nature, their representations in relief will be peculiarly instructive. The mountain range, whether scarred with peaks, or undulating in outline;—the volcano ejecting its burning missiles; —the fixed or the floating iceberg;—the glacier and its moraines; —and even the colossal wave, with its foaming crest, will be portrayed in all the grandeur of nature.

The works of human hands, too, will stand before the scholar in their pristine condition, or their ruined grandeur;—the monuments by which sovereigns and nations perpetuate their names;—the pyramids, with their mysterious legacy to science;—the gorgeous palaces of kings;—the garish temples of superstition;—and the bastions and strongholds of war, will be seen as if the observer were placed at their base, and warmed by the very sun which shines upon their walls.

Although few of our village youth may become sculptors, yet the sight of ancient statues, in actual relief, and in their real apparent magnitude, cannot fail to instruct and to refine them. To gaze upon the masterpieces of ancient art, standing in the very halls which they occupy, or to contemplate the *chefs d'œuvres* of modern or living artists, with the sculptor himself standing by their side, must excite an interest of no ordinary kind.

The works of the architect, the engineer, and the mechanist, may also be exhibited in full relief at our schools;—the gigantic aqueducts of ancient and modern times;—the viaducts and bridges which span our valleys and our rivers;—and the living machinery in our factories and workshops, which toil daily for our benefit, and supply the commerce of the world.

With such means in our power, cheaply obtained, and easily applied, a large portion of scientific instruction may be instilled into the youth of our schools,—familiarising them with the works of their Maker, and preparing them for the reception of that higher revelation with which the truths of science cannot fail to harmonise. The knowledge thus imparted will not be confined to the schoolroom. It will elevate the amusements of the holiday and the leisure hour. It will pass into the cottage, amusing and enlightening its inmates. It will find its way into the workshop, giving skill to the workman, and value to his work. It will insinuate itself into the servants' hall, and even into the boudoir and the drawing-room, returning an usurious interest upon the liberality which introduced it into the school. Thus, diffused among our now popular constituencies, and appreciated by those above them, the truths of science may rise into the regions of legislation, wresting from the still reluctant statesman a measure of secular, scientific, and compulsory education, by which the benighted and criminal population around us may be taught to fear God and honour the King.

In conformity with the usual practice of the Society, the following brief notices are given of deceased Members, arranged alphabetically. In calling your attention to the present state of our Society, I regret to state that our losses during the past year have been severe, not only in their number, but in the talent and reputation of our deceased colleagues.

Sir **Archibald Alison**, Bart., was the younger son of the Rev. Archibald Alison, LL.B., a Fellow of this Society, who was for many years senior clergyman of the Episcopal Chapel in the Cowgate, Edinburgh. His son Archibald was born at Kenley, in Shropshire, in December 1792. In 1800, his father removed to Edinburgh, where his two sons received their education, and studied at the University, when its more important chairs were filled by Dugald Stewart, Playfair, and Leslie. Having chosen the law as his profession, he was called to the Bar in 1814. In the same year he made a tour on the Continent, and in conjunction with his friend Patrick Fraser Tytler, who accompanied him, he published an interesting account of it, entitled "Travels in France during the years 1814–15, comprising a residence at Paris during the stay of the Allied Sovereigns, and at Aix at the period of the landing of Bonaparte." In 1822 he was made an advocate-depute, an office which he filled with great credit till the downfall of the Wellington Administration in 1830; and, as the result of his experience in that office, in 1831 he published his work, in two vols., "On the Principles and Practice of the Criminal Law of Scotland." On the return of the Duke to power in 1834, Mr Alison was appointed to the Sheriffdom of Lanarkshire, an office which he held to the end of his life. Although his special duties as Sheriff occupied much of his time, he yet found leisure to prosecute his literary studies. During his visit to the Continent, when indignant Europe had sent the first Napoleon into exile, Sir Archibald conceived the idea of writing "The History of Europe, from the commencement of the French Revolution to the Restoration of the Bourbons in 1815." Before he quitted Edinburgh he had published the first two volumes of this able and popular work, and the third and fourth were nearly ready for the press when he removed to Glasgow, where he completed the work in fourteen volumes. In 1852 he began to publish a continuation of it in six volumes, under the title of the "The History of Europe, from the Fall of Napoleon in 1815 to the Accession of Louis Napoleon in 1852." In 1848 he published his "Military Life of the Duke of Marlborough," and in 1859 his "Lives of Lord Castlereagh and Lord Londonderry." Sir Archibald is also the author of a "Treatise on the Principles of Population," which appeared in 1840, and of a great number of interesting articles on various literary and political subjects in *Blackwood's*

Magazine, a selection from which was published in three volumes. In 1852 he received the honour of a Baronetcy from the Earl of Derby during his short term of office.

Although of a robust constitution, Sir Archibald was attacked with a severe affection of the throat in the beginning of May 1867, and on the 23d of the same month he died at Possil House, near Glasgow, in the seventy-fifth year of his age. Sir Archibald was married in 1825 to the youngest daughter of Colonel Patrick Tytler, the brother of Lord Woodhouselee, who still survives him; and he has left a daughter, and two sons, who have both distinguished themselves in the army.

Alexander Dallas Bache, LL.D., an eminent natural philosopher and engineer, was a descendant of the celebrated Franklin. He graduated at the Military Academy at West Point in 1825, and held such a high rank in his class that he was immediately appointed Professor of Engineering in that institution, but he held the chair only for a year. After serving as an officer in the corps of Engineers, for three years, he was appointed, in 1827, to the chair of Natural Philosophy and Chemistry in the University of Pennsylvania, the duties of which he discharged with distinguished ability. In 1833, he was elected superintendent of the Girard College, which had been established in Philadelphia under the princely bequest of Stephen Girard. In 1843, on the death of Professor Karsler, he was appointed superintendent of the United States Survey, a position in which, for a period of twenty-three years, he exhibited high scientific acquirements and unrivalled administrative talents. His annual reports to Congress form a series of valuable contributions to science, and have been much admired in every part of Europe. While he was president of Girard College, between 1836 and 1841, he was directed by the Board of Trustees to report upon the state of education in Europe. With this view he spent a year abroad, accompanied by his wife, and published in 1839 the result of his inquiries. On this occasion he visited Scotland, and I had the great pleasure of a visit from this distinguished philosopher.

When the Congress established, on the 3d March 1863, their National Academy of Science, he was unanimously elected their first President for six years. He discharged the duties of this office till the time of his death.*

Dr Bache was a corresponding member of the French Academy of Sciences, and of various other learned societies.

He died at Washington in 1867, and left a widow, who had been the companion of his labours.

James Black, M.D., an eminent physician, was born in 1787. He began the study of medicine in the University of Edinburgh in 1806, and became a licentiate of the Royal College of Surgeons in 1808. In 1809 he was appointed an assistant surgeon in the Royal Navy, and in the following year was appointed surgeon to the Raven sloop-of-war, in which he served on the coast of Spain during the Peninsular war.

After practising his profession for a short time in Newton-Stewart, he went to Bolton, in Lancashire, where he remained till 1839, when he removed to Manchester for the education of his family. In 1840 he was appointed physician to the Union Hospital, and lecturer on forensic medicine in the Medical School.

As a member of the Philosophical Society, of which he was chosen President in 1859, he contributed to its "Transactions" many papers on Antiquities and Geology, and enriched its Museum with numerous specimens of the rocks and fossils of South Lancashire. In 1853 he was elected president of the Provincial Medical Association, organised by the late Sir Charles Hastings of Worcester; and he was one of the original members of the British Association which met at York in 1831. In 1848 he returned to Bolton, where he remained for eight years, carrying on with activity the scientific pursuits of his early life. In 1856 he returned to Edinburgh, where he was elected a Fellow of this Society in 1857, and read several papers at its meetings. Dr Black was a Fellow of the Geological Societies of London and Paris, a member of the Medico-Chirurgical Society of Edinburgh, of the Social Science Association, and of the Historic Society of Lancashire; and he contributed several papers to their "Proceedings." Dr Black was also an active contributor to different medical and scientific journals; and it is wonderful how, amid the occupations of an extensive practice, he could have found leisure for such a variety of pursuits. His various writings, which are too numerous for insertion here, appeared as separate articles, in the "Proceedings" of the societies to which he belonged, in the medical and scientific journals of London and Edinburgh, and in the newspapers of the localities in which his lot was cast. Dr Black was a devoted philanthropist, and a defender of Scripture against science, falsely so called. He died at Edinburgh on the 30th April 1867, in the eightieth year of his age, leaving a widow and two sons to lament his loss.

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* The only separate work which he published beside his volume on Education, was an edition of Brewster's Optics, with copious notes and a large appendix.

Alexander Bryson, an eminent naturalist, was born at Edinburgh on the 12th October 1816, and was the eldest son of Robert Bryson, senior partner in the celebrated firm of clock and watchmakers. After receiving his preliminary education at the High School, he was apprenticed to a watch and clock maker in Musselburgh, and subsequently went to London to acquire a higher knowledge of his profession. On his return to Edinburgh, after a year's absence, he was received into partnership with his father and brother; and was then able to pursue his scientific tastes, by attending the classes of Chemistry and Natural Philosophy in the University, and the lectures delivered in the School of Arts. Mr Bryson was elected a Fellow of this Society in 1858, and contributed to its "Transactions" the biographies of Sir Thomas Makdougal Brisbane and Dr John Fleming, and other papers, on the Preservation of Footprints on the Sand, and on the Boring of the Pholadidæ. He was elected, in 1860, President of the Royal Society of Arts, to which he contributed several papers, for one of which, on the Method of detecting the Presence of Icebergs in Darkness, he received the Hepburn Prize. He was elected President of the Royal Physical Society in 1863, and contributed a large number of papers to its "Proceedings." Mr Bryson was likewise a member of the Society of Scottish Antiquaries, the Botanical Society, the Geological Societies of London and Edinburgh, and the British Association, at whose meetings he read various papers, chiefly on geological subjects.

Mr Bryson died at Hawkhill on the 7th December 1866, in the fifty-first year of his age.

Victor Cousin, a distinguished philosopher, was born in Paris on the 28th November 1792, and was the son of a watchmaker. He was educated at the Charlemagne Lyceum, and he was so distinguished a pupil, that at the competitions in all the French Lyceums he carried off the principal prize. Cousin had at first resolved to follow music as a profession, but having attended the lectures of Royer Collard on the History of Modern Philosophy, they made such a deep impression upon him, that he devoted himself to the study of literature and philosophy. In 1812 he was appointed assistant teacher of Greek in the École Normale for training professors, and he afterwards became a professor in the same institution. On the return of Napoleon from Elba he enrolled himself among the Royalist Volunteers; but on the Restoration of the Bourbons he resumed his studies, and though only twenty-three years of age, he was appointed the successor of Royer Collard at the Sorbonne. In this new position he assailed the opinions of the Doctrinaires, and expounded those of Reid and Dugald Stewart, which Royer Collard had first made known in France. A visit to Germany, however, unsettled his opinions, and on his return to France he expounded the views of Kant, Hegel, Fichte, and Schelling. Under the Restoration the boldness of his metaphysics exposed him to the royal displeasure. Suspended from his professorship, he became tutor to the present Duke of Montebello, and while he held that position he prepared his editions of Proclus and Descartes, and his translation of Plato. During a visit to Germany in 1825, he was arrested at Dresden, on the supposition of his belonging to the Carbonari, and being transferred to Berlin, he lay in prison for six months. On his return to Paris he opposed the Villèle ministry along with Guizot and Villemain, but he was restored to his professorship under the more liberal ministry of Martignach.

Under the Orleans dynasty Cousin obtained high preferment. Before the close of 1830 he was made Councillor of State, Member of the Royal Council of Public Instruction, Professor in the Sorbonne, Director of the École Normale, and Member of the French Academy. In 1832 he was made a Peer of France, and a Member of the Academy of Moral and Political Sciences. During the short ministry of Thiers in 1840, he filled the office of Minister of Public Instruction.

After the Revolution of February 1848, Cousin ceased to take a part in political affairs. At the instance of General Cavagnac, however, he published a popular edition of his *Profession de foi d'un vicaire Savoyard*, and of his *Justice et Charité*, in which he attacked the socialism of the day. In order to please the clerical party, he republished several of his former lectures in a volume, entitled *Du Vrai, Du Beau, et Du Bien.* During the last twenty years his chair in the Sorbonne had been filled by a substitute, and in 1852 he was, along with Guizot and Villemain, placed on the retired list, with the rank of Honorary Professor.

Between 1818 and 1865 Cousin produced many valuable works. In 1842 he edited the *Pensées* of Pascal, in which the original text was restored. In 1853 he began his historical biographies of the most remarkable women of the 18th century, of Madame de Longueville, Madame de Sablé, Madame de Chevreuse, Madame de Hautefort, and Jacqueline Pascal. In 1863 he published his *General History of Philosophy from the most remote times down to the* 18*th Century*. His works include his *Philosophical Fragments*, in 2 vols., his editions of Plato, Proclus, and Descartes, his *Metaphysics of Aristotle*, his *Scholastic Philosophy*, his *Lectures on the Philosophy of Kant*, his *Lectures on the History of Scottish Philosophy*, including an account of Hutcheson, Reid, Dugald Stewart, Beattie, and Ferguson, and his *Literary Fragments.* He contributed also many papers to the *Memoirs of the Academy of Moral and Political Sciences*, and to the *Journal des Savants*, and the *Revue des Deux Mondes*.

Owing to his failing health, Cousin had for several years spent the winter at Cannes. When he went there in December 1866, the state of his health was by no means alarming; but he was taken ill in the beginning of the present year, and he died on the 15th of January, in the seventy-fifth year of his age.

Henry Home Drummond, Esq. of Blair Drummond, was born in 1783, and was the grandson of the celebrated Lord Kames. He was educated at the High School of Edinburgh, where he distinguished himself as a classical scholar, and he afterwards studied at Oxford, where he took the degree of LL.B. Having been educated for the bar, he was admitted a member of the Faculty of Advocates in 1808. In 1812 he was appointed one of the depute-advocates, and during his continuance in that office he was entrusted with the management of a large part of the criminal business of Scotland, at a time when, in the State trials of from 1807 to 1821, courage as well as skill was required in the public prosecutor. Having discharged with distinguished ability the duties thus imposed upon him, he resigned his appointment in 1821, and relinquished his general practice at the Bar.

In 1821 Mr Drummond entered Parliament as member for the county of Stirling, and he continued to discharge his parliamentary duties till 1852, when he resigned in favour of his friend and neighbour, Mr Stirling of Keir. During that long period of public service he gave valuable aid in passing the various statutes relating to Scotland; but the country is under special obligations to him for the Turnpike and Statute Labour Acts, the Salmon Fishing Act of 19 Geo. IV., and especially the Act for the Recovery of Small Debts, which confers the most signal benefits upon the poor.

As a country gentleman, a landlord, and an ardent and skilful improver of his estates, his name will be long remembered in his county. Although it is to Lord Kames that we owe the happy idea of floating away to the Forth the moss which covers the rich alluvial soil beneath the Blair Drummond Moss, it was his grandson who completed this great enterprise, and converted into a fertile field this wide and useless expanse.

Mr Home Drummond, who had long been in feeble health, died in September 1867. He was married to Miss C. Moray of Abercairney, and has left behind him two sons and a daughter— Mr G. Stirling Home Drummond of Ardoch, who succeeds to the paternal estates; Mr C. Home Drummond Moray of Abercairney; and Her Grace The Dowager-Duchess of Athole.

Michael Faraday, a distinguished chemist, was born at Newington Butts, Surrey, on the 22d September 1791. His father was a smith, and at the age of fourteen he was apprenticed for seven years to a bookbinder. In 1812 he became a journeyman bookbinder, and in that year he attended the course of lectures of Sir H. Davy, in the Royal Institution. Having sent to Sir Humphry the notes which he had taken of his lectures, and requested his assistance in obtaining some position which would allow him to pursue his scientific tastes, Sir Humphry kindly attended to his request, and procured for him the place of chemical assistant in the laboratory of the Royal Institution. Faraday entered upon this office in March 1813, and at Sir Humphry's request he accompanied him as his amanuensis on his tour to the Continent in 1814. Upon their return, in 1815, Faraday resumed his place at the Royal Institution, and began that course of experimental research which led him to such brilliant discoveries.

In May 1821 he was appointed superintendent of the house and laboratory of the Institution. In 1823 he was elected a corresponding member of the French Academy of Sciences. On the death of Dalton, in 1844, he was elected one of the eight Foreign Associates of that distinguished body; and since the death of Humboldt, he has been the eldest member in that class of the Academy. In 1824 he was elected a fellow of the Royal Society of London, and for his brilliant discoveries, recorded in their Transactions, he received successively the Copley, Rumford, and Royal Medals, being, with one exception, the only person who has received all the medals which the Royal Society can bestow. In 1827 he published his work on Chemical Manipulation, which reached a second edition in 1836, and a third in 1842. In 1829 he was appointed Lecturer on Chemistry to the Royal Military Academy at Woolwich. In 1832, when the British Association met at Oxford, he received the degree of D.C.L. In 1833 he was appointed Fullerian Professor of Chemistry in the Royal Institution. In 1835 Lord Melbourne granted him a pension of L.300, in recognition of his great discoveries. In 1836 he was appointed scientific adviser to the Trinity House, in reference to the lighthouses under their management, and in the same year he was nominated one of the senate of the University of London. In 1842 he was made Chevalier of the Prussian Order "*Pour le Merite*," founded by Frederick the Great, and recently extended to men of science and learning, who are recommended by the Royal Berlin Academy of Sciences. In 1855 he received the decoration of Commander of the Legion of Honour, and he obtained similar decorations from other sovereigns.

In 1855, he published his "Observations on Mental Education," a lecture delivered before Prince Albert, in which he advocates the teaching of natural science in our schools and colleges.

In 1858 Her Majesty allotted him a residence at Hampton Court, where he died on the 25th August 1867, in the 76th year of his age.

We cannot close this brief sketch of the life of Faraday without a notice, however imperfect, of several of the brilliant discoveries which have placed him at the head of the experimental philosophers of every age.

His first experiment, made in 1816, was an analysis of a specimen of caustic lime, which was published, with observations, by Sir H. Davy. In 1817 and 1818, he discovered that the velocity of gases in passing through a narrow tube, depended not only on their density, but on their own nature; and these experiments were followed, at different dates, by a variety of what may be called his minor discoveries, when compared with those on electricity and magnetism. The most important of these relate to the combustion of the diamond;—to the sounds produced by a bar of heated iron laid upon a mass of metal, the experiment of Mr A. Trevelyan, described in our Transactions;—to the evaporation of mercury at low temperatures;—to the optical illusions produced in the *phenokistoscope* of Plateau;—to the acoustic figures of Chladni;—to the remarkable phenomenon of *regelation*, so successfully pursued by Professor Tyndall;—and to the mysterious movements of turning tables, which he so ingeniously explained. In 1820 he described two new compounds of chlorine and carbon. In 1823 he began his fine experiments on the condensation of gases into liquids; and, by refrigerating mixtures, he obtained liquids more dense than water, from a variety of gases; but in 1844, by combining a mechanical pressure of fifty atmospheres with cold of $-166°$ of Fahrenheit, he obtained in a liquid state olefiant gas, fluosilicic acid, phosphorated hydrogen, and arsenical hydrogen. With this double power he converted the first gases which he liquefied into solid crystals, but those last mentioned he was not able to solidify. In the compression of oil gas, in 1825, he discovered a new compound, the bicarburet of hydrogen, from which Dr Hoffman has extracted another substance of great value in the production of colour. In 1857, Faraday published his curious experiment, in which a gold leaf, placed upon a plate of glass, becomes transparent and colourless at a high temperature, and recovers its green colour by transmitted light, under pressure. In 1820, he discovered the valuable properties of alloys of rhodium and steel, and of silver and steel for cutting instruments. In 1827, he published his work on the "Manufacture of Glass for Optical Purposes," and in his Memoir on the same subject, in 1829, he has given a minute account of all the processes which he employed.

These various researches, numerous and brilliant as they are, might have been the occupation of a busy life, but they form only an introduction, as it were, to the grand discoveries in electricity and magnetism with which his name is more specially associated.

With the exception of his papers on the Electricity of the Gymnotus, and the Electricity Developed by the Friction of Globules of Water upon Solid Bodies, his discoveries in electricity and magnetism may be arranged in three groups,—those that relate to electro-chemistry;—those that relate to electro-dynamical and electro-statical induction;—and those that relate to the action of magnetism and dynamic electricity, upon light and all the other bodies of nature.*

The discoveries in these three groups, which are too numerous and profound to be noticed in a brief sketch of his life, he began to publish in the "Philosophical Transactions" for 1831. They were continued in successive volumes of that work, and were afterwards republished in four octavo volumes, which appeared in 1839, 1844, 1855, and 1859.

As an original investigator of scientific truth, Faraday had few, if any, equals; and as a lecturer and expounder of the discoveries of others he was without a rival. With a judgment thus sound and thus patiently exercised, he had no difficulty in answering the question "What is truth?" among the complex laws of the material world, and he had none in answering the question as put by the Roman Governor. Like Newton, the greatest of his predecessors, he was a humble Christian, with the simplicity of apostolic times. Among the grand truths which he had studied and made known, he had found none out of harmony with his

* See "Notice sur Michael Faraday sa vie et ses Travaux, par Professeur De La Rive, Geneve, 1867," a pamphlet containing an interesting account of Faraday's discoveries. A translation of it is published in the "Philosophical Magazine," vol. xxxiv. p. 409.

faith; and from the very depths of science he has proclaimed to the Sciolists, that there is a wisdom which is not "Foolishness with God."

John Goodsir, a celebrated anatomist, was born at Anstruther in 1814, and was the eldest son of Dr Goodsir, surgeon in that town. After passing through the curriculum of arts at the University of St Andrews, he was apprenticed to Mr Nasmyth, the celebrated dentist in Edinburgh. While he was going through the usual course of medical instruction at the University, he also pursued his anatomical studies under Dr Knox, and the study of mineralogy under Professor Jameson. After obtaining license from the College of Surgeons, he returned to Anstruther, to practise medicine with his father, and in this favourable locality he found leisure to study the various forms of animal life which are so numerous in the Firth of Forth. In 1839 he published in the "Edinburgh Medical and Surgical Journal" an elaborate memoir on the development and structure of the human teeth, and he was soon after this appointed Conservator of the Museum of the College of Surgeons. While he held this office, but particularly in 1842 and 1843, he delivered a series of lectures on various branches of anatomy and physiology. In 1840 he became a member of the Wernerian Society, and contributed many papers to its Memoirs. In 1842 he was elected a Member of this Society, and enriched our Transactions and Proceedings with many valuable papers. When Professor Monro required an assistant, Mr Goodsir was appointed Demonstrator of Anatomy in the University; and when the chair was vacant in 1846, he was appointed to it by the Town Council. In this position, so favourable for research, he prepared an extensive series of specimens illustrative of the anatomy of the animal kingdom, which now constitute the most valuable part of the University Anatomical Museum. As a teacher he enjoyed a high reputation, and he had the gratification of lecturing in the winter session to between 300 and 400 pupils. Under such engrossing studies, with which his whole time was occupied, Mr Goodsir's health gave way, and he was obliged, in 1855, to seek for its restoration in a visit to the Continent. Though still in feeble health on his return to Scotland, he continued to prosecute with ardour his anatomical studies, and in 1856 he published a series of memoirs on the structure of the skeleton, which added greatly to his reputation. Although Mr Goodsir continued to discharge the duties of his class, and carry on his original researches, his health was gradually giving way. He had been afflicted for many years with a general paralysis, which carried him off on the 6th March 1867. In order to do honour to his memory, his friends and pupils have resolved to establish in the University a Fellowship in Anatomy and Physiology bearing his honoured name.

Robert Edward Scoresby-Jackson was born at Whitby in 1833, and was the nephew of our celebrated colleague the late Dr William Scoresby. He prosecuted his medical studies in London, where he became a licentiate of the Apothecaries' Company in 1855. In 1857 he came to Edinburgh, and took the degree of M.D. He then visited the Continent, and on his return to Edinburgh, where he settled as a physician, he became a Fellow of the Royal College of Surgeons in 1859, a Fellow of this Society in 1861, and a Fellow of the Royal College of Physicians in 1862. In 1860 he wrote a Life of his uncle. In 1862 he published his *Medical Climatology*, and in 1863 he read an interesting paper to this Society on the Influence of Weather upon Disease and Mortality, a subject to which he had devoted much attention, and another *on the Temperature of certain Hot Springs in the Pyrenees.* As chairman of the medical department of the Meteorological Society, he conducted, under its auspices, some important inquiries into climate, and he published several valuable papers in its "Proceedings." On the appointment of Dr Douglas Maclagan to the chair of Medical Jurisprudence in the University, Dr Jackson succeeded him as lecturer in Materia Medica and Therapeutics in the extra-Academical School of Edinburgh; and the last work which he published was entitled "A Note-Book of Materia Medica, Pharmacology, and Therapeutics." Dr Jackson was in 1865 elected one of the physicians of the Royal Infirmary. Besides the papers we have mentioned, he contributed several articles to the "Edinburgh Medical Journal." Dr Jackson was an active member of the Edinburgh Medical Missionary Society, and an earnest student of divine truth. He was attacked with typhus fever caught in the Infirmary, and died on the 1st February 1867, in the thirty-fourth year of his age. Dr Jackson was married to the only daughter of Sir William Johnston of Kirkhill, and has left a widow and two daughters to lament his loss.

Thomas Richardson, an eminent chemist, was born at Newcastle on the 8th October 1816, and was educated in that city. At a comparatively early age he went to the University of Glasgow, where he prosecuted his chemical studies in the laboratory of the late Dr Thomson. From Glasgow he went to Germany, where he pursued his favourite science at the University of Giessen, in the celebrated laboratory of organic chemistry, then under the direction of Baron Justus Liebig. After taking the degree of Ph.D. he accompanied Dr Thomson to Paris, where he completed his studies under the late celebrated Pelouze, whose recent death has deprived the Academy of Sciences of one of its most distinguished members.

On his return to Newcastle Dr Richardson devoted himself chiefly to the application of chemistry to manufactures, and the results of his researches have been published in an important work, entitled "*Chemical Technology;* or, Chemistry in its Application to Arts and Manufactures." ~~This~~ work was commenced as a translation of Knapp's *Technology*, by Drs Ronald and Richardson in 1847. The first two parts of a second edition greatly enlarged, and forming quite a new work, by the same authors, was published in 1865. Parts third and fourth, by Dr Richardson and Dr Watt, appeared in the years 1863–1866. This valuable work is still far from being completed. Dr Richardson also took an important part in the preparation of the work upon "The Industries of the Tyne, the Wear, and the Tees."

During the last two years of his life Dr Richardson was engaged at Kirklees, near Wigan, in a series of elaborate experiments on the coal of that district, with the view of obtaining for it a place on the Admiralty list for naval purposes.

In 1853, on the death of our late colleague, Professor Johnston Dr Richardson was appointed Reader of Chemistry in the University of Durham. On this occasion the degree of M.A. was conferred upon him, and he continued for fourteen years to discharge the duties of the chair with great credit to himself, and satisfaction to the University.

When he was engaged at Wigan with his experiments on coal, he was attacked by paralysis on the 10th of July 1867, and expired in a few hours. Dr Richardson was elected a Fellow of this Society in 1866, and he was a Fellow of the Royal Society of London, a Member of the Royal Irish Academy, and an Associate of the Institution of Civil Engineers.

THE EARL OF ROSSE, WILLIAM PARSONS, a distinguished astronomer, was the eldest son of Lawrence, the second Earl, and was born in the city of York on the 17th June 1800. In 1818 Lord Oxmantown entered Trinity College, Dublin, and in the following year he passed into residence in Magdalene College, Oxford, where he took the degree of M.A. in 1822, when he was first-class in mathematics. After quitting Oxford he directed his attention to the construction of reflecting telescopes, and while he was occupied with his earliest experiments, I had the pleasure of frequent communication with him. His first scheme was to remove as much as possible the spherical aberration of spherical surfaces, by dividing the speculum into several rings, which were so placed as to have a common focus. The difficulty of adjusting these rings, and keeping them in their place, was so great that he abandoned the attempt, and set himself to the construction of telescopes with specula of a large size. In the execution of such instruments a thorough knowledge of chemistry and mechanics was required, and the difficulties which he encountered at every step of the process were surmounted with a success greater than he could have anticipated.

With the exception of Sir W. Herschel's large speculum of four feet, the largest telescopes hitherto constructed were those of 13½, 15, and 21 inches in diameter, by Mr Ramage of Aberdeen, and those of 18 inches, by Sir John Herschel. So early as 1822 Lord Oxmantown began to construct large specula, and he had ground and polished them of 15, 24, and 36 inches in diameter before he began the gigantic speculum of six feet, with a focal length of 56 feet. This speculum was cast on the 13th April 1842, ground in 1843, polished in 1844, and ready for trial in February 1845. When it was placed in a tube made of deal staves an inch thick, and hooped with strong iron clamp rings, it was established between two lofty castellated piers 60 feet high, and raised to different altitudes by a strong chain cable attached to the top of the tube.

With this noble instrument, which cost L.20,000, Lord Rosse made a series of important observations on nebulæ and clusters of stars, which have been published in the Transactions of the Royal Society of London, who evinced the high value which they put upon them by giving him the Royal Medal. Many of the principal scientific institutions in Europe hastened to do him honour. In 1849 he was elected President of the Royal Society of London. The University of Cambridge conferred upon him the degree of LL.D. The Imperial Academy of St Petersburg elected him an honorary member; and he was a member of the Royal Irish Academy, and the Astronomical and Geological Societies of London. He was made a Knight of St Patrick by the Queen, and he received from Napoleon III. the decoration of the Legion of Honour. Lord Rosse was also a trustee of the British Museum, and in 1862 he was elected Vice-Chancellor of the University of Dublin.

In 1821 Lord Rosse was elected Member of Parliament for King's County, and he continued to represent it till the end of the first reformed Parliament. After he succeeded his father in 1841, he sat in the Upper House as a representative Peer. After a protracted illness, Lord Rosse died at Monkstown, near Dublin, on the 31st of October 1867, and is succeeded by his eldest son, Lord Oxmantown, who inherits the taste and abilities of his father.

James Smith of Jordanhill, an eminent geologist, was born in Glasgow on the 15th August 1782, and was the son of Archibald Smith, a West Indian merchant resident in that city. After studying at the Grammar School and University of Glasgow, he became a partner in the West India house of Leitch and Smith; but he never took an active part in business, devoting his leisure entirely to literary and scientific pursuits. His love of yachting was one of the most prominent features of his life. He performed his first cruise to the Isle of Skye in 1806, in a small vessel of twelve tons, with Professor Milne and Dr Ure, and he was one of the earliest Commodores in the Royal Northern Yacht Club. He had thus many opportunities of carrying on in different localities his scientific inquiries, and his writings show how successfully he availed himself of them. After the peace in 1814, Mr Smith visited France and Italy, where he resided for some time, occupied chiefly with the study of their works of art. About the year 1830 he began to take an active interest in the management of the Andersonian Institution, of which he was President, and he was the founder of its Natural History Museum, and presented to it its valuable collection of Scottish coins. His earliest scientific paper was a notice printed in the "Transactions of the Antiquarian Society" of an undescribed vitrified fort in the Burnt Isles of the Kyles of Bute. In dredging on the Frith of Clyde, and examining the superficial deposits of the existing shells, he found that a large proportion of those which are not in the Clyde are still to be found in the Arctic Seas; and he was thus led to announce to the Geological Society in 1836, that the climate of this country was once colder than at present. From 1839 to 1846 Mr Smith resided successively at Madeira, Gibraltar, Lisbon, and Malta, on account of the health of some of his family, and in each of these localities he found the materials for the most interesting of his writings.

During his residence at Malta he carried on those remarkable inquiries by which he has attained a high reputation as a Scripture critic and theologian. The work which contains them was published in 1848, under the title of "The Voyage and Shipwreck of St Paul, with Dissertations on the Life and Writings of St Luke, and the Ships and Navigation of the Ancients." His views on the shipwreck of St Paul have been admired by the most eminent theologians of every country; and his essay on the Life of St Luke and the sources of his writings, has been highly praised, even by those who do not adopt all the views of its author. In the last edition of this work, in 1866, Mr Smith has expressed his gratification on finding that his views have received a remarkable confirmation by the publication of Dr Cureton's translation of the newly discovered Syriac version of St Matthew.

Mr Smith was a member of many of our scientific institutions. He was elected a Fellow of the Royal Society of London in 1830, and of this Society in 1822. He was also a Fellow of the Wernerian Society of Edinburgh, and of the Geological Society of London.

Mr Smith enjoyed good health till the spring of 1866, when he had an attack of paralysis, which did not affect his mind; but a recent attack, at the close of the year, had a fatal termination, and he died on the 17th January 1867, in the eighty-fifth year of his age.

Mr Smith was married, in 1809, to the granddaughter of Dr Wilson, Professor of Astronomy in Glasgow, and he left nine children, of whom only three survive, viz., Archibald Smith, Esq., F.R.S., a distinguished mathematician and barrister; the wife of Walter Buchanan, Esq., M.P.; and the wife of the late William Hamilton, Esq. of Minard.

Sir **James South**, an eminent astronomer, was born in London in 1785. He was the son of Mr South, a dispensing druggist in Southwark. His son, however, chose a higher branch of the medical profession, and became a member of the Royal College of Surgeons. Although he practised medicine for some years in Southwark, the greater part of his time was spent in the study of practical astronomy.

In his observatory in Blackman Street, Southwark, Mr South had a very fine five feet telescope, mounted equatorially, and with it, and a seven feet telescope equatorially mounted, he and Mr Herschel carried on, in the years 1821, 1822, and 1823, a series of most valuable observations on 3000 double and triple stars, measuring their apparent distances and positions, and comparing them with those of other astronomers. The large volume containing these remarkable observations was communicated to the Royal Society of London on the 15th January 1824, and is published as a part of their Transactions for that year. For the part which he took in this great work Sir James received the Copley Medal from the Society.

In the vicinity of one of the great thoroughfares of the metropolis astronomical instruments require particular caution against tremors, and therefore Mr South removed to Camden Hill, Kensington, where he erected a fine observatory, and furnished it with a magnificent equatorial instrument, executed by Troughton, but owing to some imperfection in its construction that was never remedied, Sir James was never able to make with it a continued series of observations. As one of the finest instruments of the day, it was visited and occasionally used by many distinguished foreigners, who were always hospitably received at Camden Hill.

Sir James was one of the founders of the Royal Astronomical Society, and was once its President. In 1830, when the Duke of Wellington was at the head of the Government, he received the honour of Knighthood, and a pension of L.300 a-year was afterwards conferred upon him in consideration of his services to astronomy. Sir James was a Corresponding Member of the Imperial Academy of Sciences at St Petersburg, of the Royal Belgic Academy of Sciences, an Honorary Member of the Royal Irish Academy, and a Fellow of the Linnean Society. In his later years he was afflicted with severe deafness, and spent much of his time in the use of the microscope. He died at Camden Hill in October 1867, in the eighty-second year of his age.

John Stewart, of Nateby Hall, a gentleman versed in various branches of natural science, was born at Parkhouse, Stranraer, on the 10th January 1813, and was the son of Lieutenant Leveson Douglas Stewart, R.N. He was educated at the Academy and at the University of Edinburgh. He began life as a merchant, but he soon quitted his profession, his ample fortune enabling him to devote his time to different scientific pursuits, but especially to geology and various departments of natural history, in which he made very large and valuable collections. He devoted much of his time to the microscope, and was one of the first to execute instantaneous photographs.

Mr Stewart was a member of the Royal Physical Society of Edinburgh, and of the Botanical Society. He died on the 17th March 1867.

The following statement respecting the Members of the Society was read by the Chairman:—

I. Honorary Fellows—

Royal Personage,	1	
British Subjects,	18	
Foreign,	33	
Total Honorary Fellows,		52

II. Non-Resident Member under Old Laws, ... 1

III. Ordinary Fellows—

Ordinary Fellows at November 1866, ... 276

New Fellows, 1866–67—Rev. Dr L. Alexander, Thomas Annandale, George F. Barbour, Dr A. H. Bryce, David Davidson, Francis Deas, Henry Dircks, Dr James Donaldson, G. S. Home Drummond, Dr T. R. Fraser, Professor Fuller, Dr Charles Gainer, Dr A. Gamgee, Dr A. Graham, Dr D. R. Haldane, Sheriff Hallard, J. H. B. Hallen, Sir George Harvey, T. B. Johnston, William Keddie, John M. M'Candlish, Jas. Richardson, William Turnbull, Peter Waddell, ... 24

300

Deduct Deceased—Sir Archibald Alison, Dr James Black, Alexander Bryson, H. Home Drummond, Professor Goodsir, Dr R. S. Scoresby-Jackson, J. G. Kinnear, Professor Richardson, James Smith, Sir James South, John Stewart, ... 11

Resigned—Rev. James S. Hodson, D.D. Oxon., Rev. L. Shafto Orde, ... 2

Total Deductions, ... 13

Total Number of Ordinary Fellows at November 1867, 287

It was announced from the Chair that the Council had awarded the Keith Prize, for the biennial period ending April 1867, to Professor C. Piazza Smyth, for his paper on Recent Measures at the Great Pyramid, published in the Transactions.

The following Gentlemen were elected Fellows of the Society:—

I. *Foreign Honorary Fellows :—*

1. Professor BENJAMIN PEIRCE, Director of the United States' Survey, Harvard University, Cambridge, Massachusetts.
2. CHARLES LE COMTE DE REMUSAT, Member de l'Institut de France, Lafitte, Haute Garonne, France.
3. FRIEDRICH WÖHLER, Göttingen.

II. *British Honorary Fellows :—*

1. James Prescott Joule, LL.D., Thorncliff, Old Trafford, Manchester.
2. Charles Wheatstone, D.C.L., Professor of Experimental Philosophy, King's College, London.

III. *Ordinary Fellow :—*

Robert Daun, M.D., Deputy Inspector-General of Hospitals (re-elected, having resigned the Fellowship in 1845).

The following Donations to the Society were announced :—

Balfour (John Hutton). Obituary Notice of Professor John Goodsir. Edinburgh, 1867. 8vo.—*From the Author.*

Bert (Dr Paul). Note sur un cas de Greffe Animale. 8vo.—*From the Author.*

——— Recherches Expérimentales pour servir a l'histoire de la Vitalité propre des Tissus Animaux. Paris, 1866. 4to.—*From the Author.*

——— Recherches sur les Mouvements de la Sensitive (*Mimosa pudica*, L.). Paris, 1867. 8vo.—*From the Author.*

——— Notes d'Anatomie et de Physiologie Comparées. Paris, 1867. 8vo.—*From the Author.*

——— Sur un Monstre double Autositaire de la Famille des Monosomiens. Paris, 1863. 8vo.—*From the Author.*

Brusina (Spiridione). Contribuzione pella Fauna dei Molluschi Dalmati. Vienna, 1866. 8vo.—*From the Author.*

Catalogue. Index to the Catalogue of Books in the Bates Hall of the Public Library of the City of Boston. First Supplement. Boston, 1866. 8vo.—*From the Library.*

Coleman (Rev. Lyman), D.D. The Great Crevasse of the Jordan and of the Red Sea. 8vo.—*From the Author.*

Delesse (M.), et Lapparent (M. de). Revue de Géologie pour les Années 1864 et 1865. Paris, 1866. 8vo.—*From the Author.*

Dircks (Henry), C.E., F.C.S. The Polytechnic College. A proposed Institution for aiding depressed Talent to complete Works in progress connected with Science, Literature, or Arts. London, 1867. 8vo.—*From the Author.*

Dircks (Henry), C.E., F.C.S. Inventors and Inventions. London, 1867. 8vo.—*From the Author.*

Hinrichs (Gustave). Atomechanik oder die Chemie eine Mechanik der Panatome. Iowa-City, Etats Unis, 1867. 4to.—*From the Author.*

Journal. American Journal of Science and Arts. Second Series. Nos. 129, 130, 131. 8vo.—*From the Editors.*

Lapparent, *vide* Delesse.

Lawson (Charles). Pinetum Britannicum. Parts XXV., XXVI. Elephant fol.—*From the Author.*

Lea (Isaac), LL.D. Check List of the Shells of North America (Unionidæ). 8vo.—*From the Author.*

——— Tables of the Rectification of Mr T. A. Conrad's "Synopsis of the Family of Naïades of North America." Philadelphia, 1866.—*From the Author.*

——— Observations on the Genus Unio, together with descriptions of new species in the family Unionidæ, and descriptions of new species of the Melanidæ, Limneidæ, Paludinæ, and Helicidæ, with 24 Plates. Vol. XI. 4to.—*From the Author.*

Lesley (J. P.). Notes on a Map intended to illustrate five types of Earth-surface in the United States, between Cincinnati and the Atlantic Seaboard. Philadelphia, 1866. 4to.—*From Dr J. Young.*

Manuscripts. Facsimiles of National Manuscripts of Scotland, selected under the direction of the Right Hon. Sir William Gibson-Craig, Bart., Lord Clerk-Register of Scotland, and Photozincographed, by command of Her Majesty Queen Victoria, by Colonel Sir Henry James, R.E., Director of the Ordnance Survey. Part I. 1867. Folio.—*From the Secretary of State for War.*

Martius (Dr Carl Friedrich Phil. von). Beiträge zur Ethnographie und Sprachenkunde Amerika's zumal Brasiliens. 2 vols. Leipzig, 1867. 8vo.—*From the Author.*

Météorologie de la Belgique Comparée a celle du Globe, par Ad. Quetelet. Bruxelles, 1867. 8vo.—*From the Royal Observatory, Brussels.*

Meteorology. Results of twenty-five years' Meteorological Observations for Hobart Town, together with a two years' Register of the Principal Atmospheric Meteors and Aurora Australis. By Francis Abbott, F.R.A.S. Hobart Town, 1866. 4to.—*From the Author.*

Maestri (Pierre). Rapport soumis a la Junte Organisatrice sur le programme de la VI^{me} Session du Congrés International de Statistique. Florence, 1867. 8vo.—*From the Author.*

Mitra (M. L.). The Ultimate Structure of Voluntary Muscular Tissue, and the Mode of Termination of Motor Nerves. Edinburgh, 1867. 8vo.—*From the Author.*

Modderman (W.). De Wettelijke Bewijsleer in Strafzaken. Utrecht, 1867. 8vo.—*From the Author.*

Mueller (Ferdinandus), Ph.D., M.D. Fragmenta Phytographiæ Australiæ. Vol. III. and V. Melbourne, 1862–66. 8vo.—*From the Author.*

Murchison (Sir Roderick Impey), Bart., K.C.B. Siluria; A History of the Oldest Rocks in the British Isles and other countries. Fourth Edition. London, 1867. 8vo.—*From the Author.*

Neilreich (Dr August). Nachträge zur Flora von Neider-Oesterreich. Wien, 1866. 8vo.—*From the Zoologico-Botanical Society of Vienna.*

Plantamour (E.). Des Anomalies de la Température Observées a Genève pendant les quarante Années 1826–65. 4to.—*From the Author.*

Quetelet (Ad.). Des Lois Mathématiques concernant les Étoiles Filantes. 8vo.—*From the Author.*

Quetelet (Ern.). Mémoire sur la Température de l'Air à Bruxelles, 1867. 4to.—*From the Author.*

Rankine (W. J. Macquorn). Mechanics (applied). Edinburgh, 1857. 4to.—*From the Author.*

Rive (Professeur A. de la). Notice sur Michel Faraday sa vie et Travaux. Genève, 1867. 8vo.—*From the Author.*

Rizzoli (Francesco). Nuovo processo operatorio per la cura di una vasta apertura Uretro-Cisto-Vaginale. Bologna, 1867. 8vo. —*From the Author.*

Robertson (George). Recent Marine, Hydraulic, and Sanitary Engineering in Scotland. Edinburgh, 1867. 8vo.—*From the Author.*

Rutherford (Wm.), M.D. A Physiological Demonstration, given in the Physiological Laboratory of the University. 8vo.—*From the Author.*

Ryan (Matthew). The Celebrated Theory of Parallels. Second Edition, with Supplement Appendix. Washington, 1866. 8vo.—*From the Author.*

Thomson (J. T.), F.R.G.S. Sequel to some Glimpses into Life in the Far East. London, 1865. 8vo.—*From the Author.*

Tillman (S. D.), A.M. A new Chemical Nomenclature. Albany, 1866. 8vo.—*From the Author.*

Turnbull (William P.). Birds of East Lothian and a portion of the adjoining counties. Glasgow, 1867. 8vo.—*From the Author.*

TRANSACTIONS AND PROCEEDINGS OF SOCIETIES, ACADEMIES, AND UNIVERSITIES.

Berlin.—Monatsbericht der Königliche Preussischen Akademie der Wissenschaften zu Berlin. March—July 1867. 8vo.—*From the Academy.*

Berne.—Beitraege zur Geologischen Karte der Schweiz herausgegeben von der Geologischen Commission der Schweizerischen Naturforschenden-Gesellschaft auf rosten der Eidgenossenschaft. Lieferung, 3–5. 4to.—*From the Natural History Society of Berne.*

Boston.—Condition and Doings of the Society of Natural History. 1866. 8vo.—*From the Society.*

Memoirs of the Society of Natural History. Vol. I. Parts 1 and 2. 4to.—*From the Society.*

Proceedings of the Society of Natural History. Vol. X., pages 289 to 418; Vol. XI., pages 1 to 96. 8vo.—*From the Society.*

Bourdeaux.—Mémoires de la Société des Sciences Physiques et Naturelles de Bordeaux. Tome IV., V. 8vo.—*From the Society.*

Brussels.—Tables Générales et Analytiques du recueil des Bulletins de l'Académie Royale des Sciences, des Lettres, et des Beaux-Arts de Belgique. Tome I.–XX. 8vo.—*From the Academy.*

Bulletins de l'Académie Royale des Sciences, des Lettres et des Beaux-Arts de Belgique. Tome XXII., XXIII. 8vo.—*From the Academy.*

Biographie Nationale publiée par l'Académie Royale des Sciences, des Lettres, et des Beaux-Arts de Belgique. Tome I. Partie 2. 8vo.—*From the Academy.*

Bulletin de l'Académie Royale des Sciences, des Lettres, et des Beaux-Arts de Belgique. Tome XXIII. No. 4–6; Tome XXIV. No. 8, 9, et 10. 8vo.—*From the Academy.*

Mémoires de l'Académie Royale des Sciences, des Lettres, et des Beaux-Arts de Belgique. Tome XXXVI. 4to.—*From the Academy.*

Annuaire de l'Académie Royale des Sciences, des Lettres, et des Beaux-Arts de Belgique. 1867. 12mo.—*From the Academy.*

Annuaire de l'Observatoire Royale de Bruxelles, par A. Quetelet. 1867. 12mo.—*From the Observatory.*

Annales de l'Observatoire Royale de Bruxelles publiées aux frais de l'Etat, par le directeur A. Quetelet. Tome XVII. 4to.—*From the Observatory.*

Cadiz.—Almanaque Nautico para 1869, calculado de orden de S. M. en el Observatorio de Marina de la Ciudad de San Fernando. Cadiz, 1867. 8vo.—*From the Observatory.*

Calcutta.—Journal of the Asiatic Society of Bengal. New Series, Nos. 136, 138, 139. 8vo.—*From the Society.*

Proceedings of the Asiatic Society of Bengal. 1867. Nos. 2–7. 8vo.—*From the Society.*

Connecticut.—Transactions of the Connecticut Academy of Arts and Sciences. Vol. I. Part 1. 8vo.—*From the Academy.*

Cornwall.—Journal of the Royal Institution of Cornwall, with the 49th Annual Report. No. 7. 8vo.—*From the Institution.*

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Journal of the Royal Dublin Society. No. 36. 8vo.—*From the Society.*

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Haarlem. — Archives Néerlandaises des Sciences Exactes, et Naturelles, publiées par la Société Hollandaise des Sciences à Haarlem. Tome I. Liv. 5; Tome II. Liv. 1, 2. 8vo.—*From the Society.*

Naturkundige Verhandelingen van de Hollandsche Maatschappij der Wetenschappen te Haarlem. Deel 24, 25. 4to.—*From the Natural History Society.*

Harvard University.—Catalogue of the Officers and Students of Harvard University, for 1866-67. 8vo.—*From the University.*

Catalogus Universitatis Harvardianæ, 1866. 8vo.—*From the University.*

Reports of the President and Treasurer of Harvard College, 1865-66. Cambridge, Mass., 1866. 8vo.—*From the College.*

Report of the Trustees of the Museum of Comparative Zoology at Harvard College in Cambridge, Mass., for 1866. 8vo.—*From the College.*

Kiel.—Schriften der Universitat zu Kiel, aus dern Jahre, 1866. Band XIII. 4to.—*From the University.*

Königsberg.—Astronomische Beobachtungen auf der Königlichen Universitäts-Sternwart zu Königsberg, 1865. Fol.—*From the University.*

Schriften der Königlichen Physicalisch-Oekonomischen Gesellschaft zu Königsberg. 1865, Abth. 1, 2; 1866, Abth. 1, 2. 4to.—*From the Society.*

Lausanne.—Bulletin de la Société Vaudoise des Sciences Naturelles. Vol. IX. No. 55-57. 8vo.—*From the Society.*

Leeds.—Annual Report of the Philosophical and Literary Society, 1866-67. 8vo.—*From the Society.*

Leipzig.—Preisschriften gekrönt und herausgegeben von der Fürstlich Jablonowskischen Gesellschaft zu Leipzig. No. XII., 1867. 8vo.—*From the Royal Saxon Academy.*

Liverpool.—Transactions of the Historic Society of Lancashire and Cheshire. Vol. VI. 8vo.—*From the Society.*

London.—Journal of the Chemical Society. Vol. V. (New Series.) Nos. 54–59. 8vo.—*From the Society.*

Journal of the Royal Geographical Society. Vol. XXXVI. 8vo.—*From the Society.*

Proceedings of the Royal Geographical Society. Vol. XI. Nos. 3, 4, 5. 8vo.—*From the Society.*

Philosophical Transactions of the Royal Society of London. Vol. CLVI. Part 2; Vol. CLVII. Part 1. 4to.—*From the Society.*

Proceedings of the Royal Society of London. Vol. XV., No. 93; Vol. XVI. Nos. 94, 95. 8vo.—*From the Society.*

List of the Royal Society of London. Nov. 1866. 4to.—*From the Society.*

Proceedings of the Royal Institution of Great Britain. Vol. V. Parts 1, 2. 8vo.—*From the Society.*

Proceedings of the Meteorological Society. Vol. III. Nos. 31, 32. 8vo.—*From the Society.*

Journal of the Linnean Society. Vol. IX. Nos. 36, 37 (Zoology); Vol. IX. No. 40; Vol. X. No. 41 (Botany). 8vo.—*From the Society.*

Proceedings of the Linnean Society for 1866–67. 8vo.—*From the Society.*

General Index to the first 25 Vols. of the Transactions of the Linnean Society. London, 1867. 4to.—*From the Society.*

Proceedings of the Royal Medical and Chirurgical Society of London. Vol. V. No. 8. 8vo.—*From the Society.*

Journal of the Statistical Society of London. Vol. XXX. Parts 2, 3. 8vo.—*From the Society.*

Quarterly Journal of the Geological Society. Vol. XXIII. Parts 2, 3, 4. 8vo.—*From the Society.*

List of the Geological Society of London, November 1867. 8vo.—*From the Society.*

Transactions of the Zoological Society of London. Vol. VI. Parts 1, 2, 3. 4to.—*From the Society.*

Proceedings of the Zoological Society of London for 1866. 8vo.—*From the Society.*

Proceedings of the Royal Horticultural Society. Vol. I. (New Series.) No. 8. 8vo.—*From the Society.*

Report of the Committee of the Harveian Medical Society, for the Prevention of Venereal Diseases. London, 1867. 8vo.—*From the Society.*

Lund.—Lunds Universitets Ars-skrift Mathematik och Naturvetenskap. Rätts och Statsvetenskap. Philosophi Språkvetenskap och Historia. 1865. 4to.—*From the University.*

Lyons.—Mémoires de l'Académie Impériale des Sciences, Belles-Lettres, et Arts de Lyon. Classe des Lettres. Tome XII. Classe des Sciences. Tome XIV., XV. 8vo.—*From the Academy.*

Annales de la Société d'Agriculture, d'Histoire Naturelle, et des Arts utiles de Lyon. Tome IX., X. 8vo.—*From the Society.*

Massachusetts.—Proceedings of the Essex Institute at Salem. Vol. IV., Vol. V. Nos. 1 and 2. 8vo.—*From the Institute.*

Melbourne.—Transactions and Proceedings of the Royal Society of Victoria. Vol. VIII. Part I. 8vo.—*From the Society.*

Milan.—Reale Istituto Lombardo di Scienze e Lettere—Classe di Scienze Matematiche e Naturali. Vol. II. Fasc. 9, 10; Vol. III. Fasc. 1–9. Classe Morali e Politiche. Vol. II. Fasc. 8–10; Vol. III. Fasc. 1–10.—8vo. Classe Matematiche e Naturali. Vol. X. Fasc. 3. Cl. Morali e Politiche. Vol. X. Fasc. 3. 4to.—*From the Society.*

Solenui Adunanze del Reale Istituto Lombardo di Scienze e Lettere. Von Guilio Carcano. 1866. 8vo.—*From the Institute.*

Annuario del Reale Istituto Lombardo di Scienze e Lettere. 1866. 12mo.—*From the Institute.*

Moscow.—Bulletin de la Société Impériale des Naturalistes de Moscou. Nos. 3 et 4, 1866; No. 1, 1867. 8vo.—*From the Society.*

Munich.—Sitzungsberichte der Königl. Bayer. Akademie der Wissenschaften zu München. Tome I. Heft 1–4; Tome II. Heft 1. 8vo.—*From the Academy.*

Abhandlungen der Historischen Classe der Königlich Bayerischen Akademie der Wissenschaften. Band IX. Abth. 3.

Mathematisch-Physikalischen Classe. Band X. Abth. 1. 4to.—*From the Academy.*

Naples.—Rendiconto delle Tornate e dei Lavori dell' Academia di Scienze Morali e Politiche, Anno sesto quaderni di Luglio e Agosto, 1867. 8vo.—*From the Academy.*

Ohio.—Report (Twentieth Annual) of the Ohio State Board of Agriculture for 1865. Columbus, 1866. 8vo.—*From the Board.*

Oxford.—Astronomical and Meteorological Observations made at the Radcliffe Observatory, Oxford, in the year 1864. Vol. XXIV. 8vo.—*From the Observatory.*

Palermo.—Giornale di Scienze Naturali ed Economiche pubblicato per cura del Consiglio di perfezionamento annesso al R. Instituto Tecnico di Palermo. Vol. II. Fasc. 2, 3, 4. 4to.—*From the Institute.*

Paris.—Annales des Mines. Tome X., XI. 8vo.—*From the Ecole de Mines.*

Nouvelles Archives du Muséum d'Histoire Naturelle. Tome I. Fasc. 1–4; Tome II. Fasc. 1–4; Tome III. Fasc. 1, 2. 4to.—*From the Natural History Museum, Paris.*

Bulletin de la Société de Géographie, Mai–Oct. 1867. 8vo.—*From the Society.*

Philadelphia.—Journal of the Academy of Natural Sciences of Philadelphia. New Series. Vol. VI. Part 1. 4to.—*From the Academy.*

Proceedings of the Academy of Natural Sciences of Philadelphia. Vol. I., 1841–43; Vol. III., 1846–47; Vol. IV., 1848–49; 1862, Nos. 1–6; 1866, Nos. 1–5. 8vo. —*From the Academy.*

Proceedings of the American Academy of Arts and Sciences. Vol. VII., pages 97 to 184. 8vo.—*From the Academy.*

Proceedings of the American Philosophical Society. Vol. X. No. 76. 8vo.—*From the Society.*

St Petersburg.—Mémoires de l'Académie des Sciences de St Petersbourg. vii^e. série. Tome X. Nos. 3–16; Tome XI. Nos. 1–8. 4to.—*From the Academy.*

Bulletin de l'Académie Impériale des Sciences de St Petersbourg. Tome X. Nos. 1–4; Tome XI. Nos. 1–4; Tome XII. No. 1. 4to.—*From the Academy.*

Compte-Rendu Annuel adressé a S. Esc. M. de Reutern, par le Directeur de l'Observatoire Physique Central A. T. Kupffer, 1864. St Petersburg, 1865. 4to.—*From the Russian Government.*

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Toronto.—Canadian Journal of Industry, Science, and Art. New Series, Nos. 63–65. 8vo.—*From the Canadian Institute.*

Turin.—Atti della R. Accademia delle Scienze di Torino. Vol. I. Disp. 3–7; Vol. II. Disp. 1–3. 8vo.—*From the Academy.*

Memorie della Reale Accademia delle Scienze di Torino. Serie seconda. Tomo 22. 4to.—*From the Academy.*

Utrecht.—Aanteekeningen van het Verhandelde in de Sectie-Vergaderingen van het Provinciaal Utrechtsch Genootschap van Kunsten en Wetenschappen ter gelegenheid van de Algemeene Vergadering, 1866. 8vo.—*From the Society.*

Meteorologische Waarnemingen in Aederland en Zijne Bezittingen en Afwijkingen van Temperatuur en Barometerstand of vele Plaatsen in Europa utigegeven door het Koninklijk Nederlandsch Meteorologisch Instituut, 1864. Utrecht, 1865. 4to.—*From the Institute.*

Nederlandsch Meteorologisch Jaarboek, 1864, 1865, 1866. Utrecht, 1866. 4to.—*From the Meteorological Institute of Utrecht.*

Verslag van het Verhandelde in Algemeene Vergadering van het Provinciaal Utrechtsch Genootschap van Kunsten en Wetenschappen gehonden den 16 October 1866. 8vo.—*From the Society.*

Vienna.—Jahrbücher der Kaiserlich-Königlichen Central-Anstalt für Meteorologie und Erdmagnetismus, von Carl Jelinek und Carl Fritsch. Band I., 1864. 4to.—*From the Society.*

Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften. Philosophisch-Historische Classe. Band LIII. Heft 1–3. Mathematisch Classe. Band LIV. Heft 1–4. 8vo.—*From the Academy.*

Washington.—Memoirs of the National Academy of Sciences. Vol. I. 4to.—*From the Academy.*

Astronomical Observations made at the U.S. Naval Observatory during 1851 and 1852. Washington, 1867. 4to. —*From the Observatory.*

Miscellaneous Collections of the Smithsonian Institution. Vols. VI. and VII. 8vo.—*From the Institution.*

Report of the Board of Regents of the Smithsonian Institution, Washington, for 1865. 8vo.—*From the Institution.*

Report of the Secretary of War, with accompanying paper. Washington, 1866. 8vo.—*From the American Government.*

Report on Epidemic Cholera. Washington, 1867. 4to.—*From the War Office, U.S.*